

3.3.4.2 Alkaline Clay Bluff

3.3.4.2.1 Community Overview

Steep clay bluffs border stretches of the Great Lakes shorelines, and are less commonly found inland on the lower portions of streams draining into Lakes Superior and Michigan. Vegetative cover can range from dense forests of red pine, white pine, northern white cedar, and white birch, to bare clay with only a few weedy herbs present. Buffaloberry is a characteristic shrub, but more typically, alders (*Alnus incana* and *A. crispa*), as well as rank herbs such as Canada goldenrod and pearly everlasting are dominant. Both native and exotic pioneers such as fireweed and Canada thistle are common, especially on the more unstable sites.

It is the semi-stabilized “weeping” bluffs that are of the greatest biological interest. Golden sedge, gentians, orchids, and calciphilic fen species may colonize such sites, which can be local repositories of rare or otherwise noteworthy plant species.

Henry Chandler Cowles, regarded as the founder of plant ecology, studied this bluff environment at the end of the 19th century (as part of his work on the Lake Border moraines, primarily in Illinois where private ownership now limits access.) He noted "there can be almost no other habitat in our climate which imposes such severe conditions upon vegetation as an eroding clay bluff." Temperature extremes, sun and wind exposure, and the variable consistency of clay soils (from mush to concrete as they dry) severely inhibit establishment by pioneer plants. During periods of erosion, Cowles felt "all vegetation is impossible."

3.3.4.2.2 Vertebrate Species of Greatest Conservation Need Associated with Alkaline Clay Bluff

There were not any vertebrate Species of Greatest Conservation Need that were identified as moderately or significantly associated with alkaline clay bluff.

3.3.4.2.3 Threats and Priority Conservation Actions for Alkaline Clay Bluff

3.3.4.2.3.1 Statewide Overview of Threats and Priority Conservation Actions for Alkaline Clay Bluff

The following list of threats and priority conservation actions were identified for alkaline clay bluff in Wisconsin. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Section 3.3.4.2.3.2 unless otherwise indicated.

Threats and Issues

- Protection of bluff hydrology is critical, so that neither too much nor too little water is moving through or across them.
- Development on the bluffs has been intensive in some areas, such as southeastern Wisconsin. This has contributed to bluff destabilization, and some of the structural solutions that have been implemented to control or retard erosion have totally destroyed the unique habitats present.
- Construction activities can easily disrupt steep slopes and accelerate erosion, which once begun, can be difficult to stop.
- Forest management on areas bordering the semi-stable patches has to be done with extreme care to avoid damage or hydrologic alteration.
- Because of the inherent disturbance associated with this type, there are opportunities for colonization by many invasive species.

Priority Conservation Actions

- Protect alkaline clay bluffs from damage caused by vehicles and foot travel.
- Use comprehensive land use planning to limit additional development of hilltops at important sites.
- Plan at the watershed level to protect hydrology and limit damaging peak flows that often occur during spring snowmelt.
- Educate the public regarding the ecological values of this community type.
- Work with private landowners to encourage their protection of ecologically valuable sites.

3.3.4.2.3.2 Additional Considerations for Alkaline Clay Bluff by Ecological Landscape

Special considerations have been identified for those Ecological Landscapes where major or important opportunities for protection, restoration, and/or management of alkaline clay bluff exist. Those considerations are described below and are in addition to the statewide threats and priority conservation actions for alkaline clay bluff found in Section 3.3.4.2.3.1.

Additional Considerations for Alkaline Clay Bluff in Ecological Landscapes with **Major** Opportunities for Protection, Restoration, and/or Management

This community is very limited in geographic scope and no major opportunities for protection remain.

Additional Considerations for Alkaline Clay Bluff in Ecological Landscapes with **Important** Opportunities for Protection, Restoration, and/or Management

Central Lake Michigan Coastal

Clay ravines that open to the Lake Michigan shore should be surveyed thoroughly to assess those sites that are most intact and support rare species. Fairy Chasm State Natural Area (Ozaukee County) and Fischer Creek State Recreation Area (Manitowoc County) contain examples of this community. Deer damage is severe in this Ecological Landscape and shoreline development limits conservation opportunities. The county management of one mile of state-owned shoreline near the mouth of Fischer Creek will potentially provide a good degree of protection to the bluffs at that site.

Northern Lake Michigan Coastal

Opportunities are few here, scattered among privately owned, localized sites near lower Green Bay or along Lake Michigan.

Southern Lake Michigan Coastal

Examples of alkaline clay bluff may be found in Milwaukee and Racine counties. Cliffside Park (Racine County) may be the best place to see the Lake Border moraines as they tower above the blue waters of Lake Michigan. Here the eroding clay bluffs are slowly entering the earliest stages of ravine formation, providing an opportunity to witness a dynamic landscape process in an urban area. Localized stretches of the clay bluffs in southern Milwaukee County (e.g., Warnimont Park) support rare plants.

Superior Coastal Plain

Continuing interest in permanent and seasonal home development and other construction along the Lake Superior shoreline may pose a threat to this community here, but there are some protected examples on public lands near the City of Superior. Past logging practices have badly damaged many of the clay bluffs in this region, which still exhibit signs of severe disturbance.